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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,590	05/16/2001	Shinji Fukasawa	010623	1417
23850	7590	08/10/2004	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP			QUACH, TUAN N	
1725 K STREET, NW			ART UNIT	
SUITE 1000			PAPER NUMBER	
WASHINGTON, DC 20006			2814	

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/855,590	Applicant(s) FUKASAWA, SHINJI	
	Examiner Tuan Quach	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 19-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 19-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 8, 2004 has been entered.

Claims 1, 19, 20, 21, and 30 are amended. Claims 1-10 and 19-30 are pending. Claims 11-18 were previously cancelled.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 19-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tottori taken with Buynoski and Ono.

Regarding claims 1, 2, 7, 19, 20, 21, 26, and 30, Tottori teaches multiple wiring structure including stack via V1, V2, V3 between wirings 21 and 24, partitioned intermediate metal layers, 21, 32, 21, 22, 33, 22, 23, 31, 23, intermediate metal wiring area sandwiched by the partitioned metal layers. See Fig. 1, column 5 lines 22-62. Note that the recitation of intermediate metal layer wiring for an ordinary wiring does not distinguish over the prior art since the metal layers 22, 33, 22, 21, 32, 21 are formed

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from the metal or conductive layer for wiring, and including via contacts V1, V2 not connected with the stack via. See column 5 lines 28-30, 48-53. Regarding the use of normal wiring, a recitation directed to the manner in which a claimed apparatus is intended to be used does not distinguish the claimed apparatus from the prior art - if the prior art has the capability to so perform. See MPEP 2114 and *Ex parte Masham*, 2 USPQ2d, 1647 (1987).

The connection and non-connection to the stack via although not explicitly recited would have been apparent as shown in Fig. 1 and would have been further obvious as evidenced by Buynoski. In particular, Buynoski also shows in Fig. 4 the connection between metal 1 and metal 4 employing stack vias 1-3, and intermediate partitioned metals 2 and 3 including area of metal 2, metal 3, via 1, via 2, that are not connected to the stack via.

Furthermore, Ono teaches effective use of wiring resource of metal wiring layers can be obtained by employing array configuration and deletion where appropriate. The cross over of signal lines can be obviated. The formation of a priority wiring direction is also taught. See Figs. 1, 3, 6, 7, [0004]-[0021].

Accordingly, it would have been obvious to one skilled in the art to have obtained the appropriate connection or non-connection to a particular via depending upon whether a connection is necessary at a particular point and as shown, the intermediate metal wiring area, e.g., 32, 33 in Tottori and intermediate metal 2 in Buynoski, is not required to be connected with all stack vias and can be patterned as desired and would have been further advantageous as evidenced by Ono as delineated above wherein

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portion of the metal can be to obtain effective use of wiring resource of metal wiring layers.

Regarding claims 20 and 21, the provision of product-by-process claim limitations would have been obvious for the reasons delineated above regarding the structures delineated; furthermore, such automatic wiring program, e.g., EDA tools is well known in the art as acknowledged by applicant on pages 1-3 of the instant specification, and as delineated in Ono, [0015], [0058].

The recitation of the priority wiring direction and appropriate partition and deletion in claims 3-6 and 22-25 would have been obvious and advantageous as taught by Ono delineated above.

Regarding the connection or connected layers being metal, non-metal layer such as polysilicon or diffused layers, e.g., claims 7-10 and 26-29, such would have been conventional and obvious given the conductive material for such layer as delineated above and as such encompasses well known materials such as aluminum, polysilicon, and conductive contacts, e.g., silicide contacts to source/drain of diffused regions, e.g., Ono, [0020], and as such would have been obvious.

Applicant's arguments with respect to claims 1-10 and 19-30 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number (571)272-1717. The examiner can normally be reached on M - F from 7 to 4.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Wael Fahmy can be reached on (571)272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1562.



Tuan Quach
Primary Examiner